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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,526	03/29/2004	Kong Weng Lee	70030845-1	3297
57299	7590	06/05/2008		
Kathy Manke Avago Technologies Limited 4380 Ziegler Road Fort Collins, CO 80525			EXAMINER MAKIYA, DAVID J	
			ART UNIT 2885	PAPER NUMBER
			NOTIFICATION DATE 06/05/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/812,526

**Applicant(s)**

LEE ET AL.

**Examiner**

David J. Makiya

**Art Unit**

2885

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5,8-12,15-19 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-12,15-19 and 22-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 8, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al. (US Patent 6,507,049) in view of Haitz (US Patent 3,780,357).

With respect to claim 1, Yeager et al. teaches a light emitting diode package comprising a one piece ceramic substrate 17 and cup 19 for mounting a light emitting diode 4, the one piece ceramic substrate and cup formed from an opaque ceramic material (Column 10, Lines 28-30) and defining a cavity with a ceramic sidewall (Column 10, Lines 28-30), wherein the cavity is shaped to focus light in a predetermined direction (Figure 2), and a metallic coating 21 on a portion of the ceramic substrate for reflecting light in a predetermined direction (Column 10, Lines 33-35).

However, Yeager et al. fails to teach the sidewalls of the cavity being vertical.

Haitz teaches a light emitting diode package (Figure 4) with a ceramic substrate (16, 18; Column 4, Lines 58-60) for mounting a light emitting diode 12, the substrate defining a cavity with reflective, vertical sidewalls 21 shaped to focus light in a predetermined direction (Figures 3A and 4), where the reflecting surface is a metallic coating (Column 5, Lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yeager et al. with the teachings of Haitz because a cavity with vertical sidewalls

would emit light “uniform in appearance” and “more intense” (Haitz; Column 5, Lines 37-43) and since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by the cavity shape of Yeager et al.

With respect to claim 8, Yeager et al. teaches a method for manufacture of a light emitting diode package comprising forming a one piece ceramic substrate 17 and cup 19 for mounting a light emitting diode 4, the one piece ceramic substrate and cup formed from an opaque ceramic material (Column 28, Lines 28-30) defining a cavity with a ceramic sidewall (Column 28, Lines 28-30), and the cavity having a bottom and a top (Figure 2), wherein the cavity is shaped to focus light in a predetermined direction (Figure 2), coating a portion of the ceramic cavity with a metallic, light reflective material (21; Column 10, Lines 33-35), positioning a light emitting diode 4 on the substrate (Figure 2), and depositing an optically transparent material 11 in the cavity to protect the light emitting diode.

However, Yeager et al. fails to teach the sidewalls of the cavity being vertical.

Haitz teaches a method for manufacture of a light emitting diode package (Figure 4) with a ceramic substrate (16, 18; Column 4, Lines 58-60) for mounting a light emitting diode 12, the substrate defining a cavity with reflective, vertical sidewalls 21 shaped to focus light in a predetermined direction (Figures 3A and 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yeager et al. with the teachings of Haitz because a cavity with vertical sidewalls would be “uniform in appearance” and “more intense” (Haitz; Column 5, Lines 37-43) and since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by the cavity shape of Yeager et al.

With respect to claims 15-17, Yeager et al. teaches the method wherein positioning the light emitting diode comprises determining a location between the bottom and the top of the cavity to locate the light emitting diode (Figure 1). It is an inherent characteristic of a light-emitting device to have a viewing angle. Based on the structure of the reference light emitting diode package, positioning the light emitting diode within the cavity will result in light emitting only within an angle created by the cavity. It is therefore inherent in the structure of the device that positioning the light emitting diode within the cavity will achieve a predetermined viewing angle of the light emitting diode while moving the light emitting diode closer to the bottom of the cavity will reduce the viewing angle and moving it closer to the top of the cavity will increase the viewing angle.

With respect to claim 18, Yeager et al. teaches the method wherein depositing the optically transparent material in the cavity to protect to light emitting diode comprises forming a domed layer 14 of the optically transparent material over the light emitting diode (Figure 2).

Claims 2-5 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al. in view of Haitz as applied to claims 1 and 8 above and further in view of Ishinaga (US Patent 6,355,946).

With respect to claims 2-5, Yeager et al. in view of Haitz teaches the light emitting diode package as described in claim 1, but fails to explicitly state the shape of the cavity to be rectangular, trapezoidal, oval or circular shaped.

Ishinaga teaches the use of rectangular (Figure 8), trapezoidal (Figure 7), oval (Figure 2), and circular (Figure 12) shaped cavities.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Yeager et al. package with the teachings of Ishinaga because different shapes would provide different illumination patterns (Ishinaga; Figures 2, 7, 8, and 12) and since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by the cavity shape of Yeager et al. in view of Haitz.

With respect to claims 9-12, Yeager et al. in view of Haitz teaches the method for manufacture of a light emitting diode package as described in claim 8, but fails to explicitly state the shape of the cavity to be rectangular, trapezoidal, oval or circular shaped.

Ishinaga teaches the use of rectangular (Figure 8), trapezoidal (Figure 7), oval (Figure 2), and circular (Figure 12) shaped cavities.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Yeager et al. method with the teachings of Ishinaga because different shapes would provide different illumination patterns (Ishinaga; Figures 2, 7, 8, and 12) and since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by the cavity shape of Yeager et al. in view of Haitz.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al. in view of Haitz as described in claim 8 and further in view of Abe (US Patent 5,177,593).

With respect to claim 19, Yeager et al. in view of Haitz teaches the method as described above, but fails to teach the optically transparent material forming a concaved layer.

Abe teaches the method of depositing an optically transparent material 35 to protect a light emitting diode 33 comprises forming a concaved layer of the optically transparent material over the light emitting diode (Figure 4B).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Yeager et al. in view of Haitz with the concave layer from teachings of Abe because having a concaved layer over the LED provides the ability to focus the emitted light in a more concentrated area and the resin would provide “excellent adhesive property to a chip and also having excellent moisture and thermal resistance” (Abe; Column 33-37).

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al. in view of Haitz as applied to claims 1 and 8 above, and further in view of Song et al. (US Patent 6,707,069).

With respect to claim 22, Yeager et al. in view of Haitz teaches the light emitting diode package as described above, but fails to teach the opaque ceramic material is an alumina or aluminum nitride based material.

Song et al. teaches a light emitting diode package with a light emitting diode 105 mounted to a ceramic substrate and cup (101,102) with a vertical sidewall (Column 2, Lines 48-51) wherein the opaque ceramic material is an alumina or aluminum nitride based material (Column 5, Lines 50-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the package of Yeager et al. in view of Haitz with the material from the teachings of Song et al. because alumina based ceramics “have high heat conductivity and a high heat dissipation effect, thus effectively solving the problems of thermal degradation of LED packages and thermal stress of package bodies caused by heat radiated from LED chips” (Song et al.; Column 3, Lines 2-15).

With respect to claim 24, Yeager et al. in view of Haitz teaches the method of manufacture of a light emitting diode package as described above, but fails to teach the opaque ceramic material is an alumina or aluminum nitride based material.

Song et al. teaches a method of manufacture of a light emitting diode package with a light emitting diode 105 mounted to a ceramic substrate and cup (101,102) with a vertical sidewall



(Column 2, Lines 48-51) wherein the opaque ceramic material is an alumina or aluminum nitride based material (Column 5, Lines 50-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the material from the teachings of Yeager et al. in view of Haitz with the teachings of Song et al. because “have high heat conductivity and a high heat dissipation effect, thus effectively solving the problems of thermal degradation of LED packages and thermal stress of package bodies caused by heat radiated from LED chips” (Song et al.; Column 3, Lines 2-15).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al. in view of Haitz as applied to claim 8 above, and further in view of Shaddock (US 2002/0163001).

With respect to claim 23, Yeager et al. in view of Haitz teaches the method as described above, but fails to teach forming the substrate comprises using a die that can be stamped on the substrate.

Shaddock teaches mounting a light emitting diode 20 in a one piece substrate and cup 116 and forming the substrate comprises using a die that can be stamped on a sheet of material to form the one piece substrate and cup (Paragraph 21).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Yeager et al. in view of Haitz with the stamping process from the teachings of Shaddock because stamping would “both cause the depression for the reflector cup and cut away windows to provide separation between the reflector cup and at least one lead” (Shaddock; Paragraph 17).

***Response to Arguments***

Applicant's arguments filed 2/7/2008 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the prior art fails to teach "a cavity with a vertical ceramic sidewall...and a metallic coating on a portion of said ceramic substrate," a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

In this case, the primary reference Yeager et al. teaches the one piece ceramic material with a metallic coating on a portion of a ceramic sidewall, but fails to teach the shape of the cavity. The secondary Haitz reference is used to show that sidewalls can be of any shape, including vertical (Figure 4a), concave (Figure 1A), tapered inward (Figure 4B), and tapered outward (Figure 6A) similar to Figure 2 of Yeager et al. The teachings clearly show the shape of a vertical sidewall and would therefore meet the limitations as claimed. Furthermore, it has been held by the courts that a change in shape or configuration, without any criticality, is nothing

more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by the cavity shape of Yeager et al.

In response to applicant's argument that the Haitz reference fails to teach "metallic coating on a portion of said ceramic substrate," Column 5, Lines 6-9 clearly show the conventional method of making a reflective surface in "prior art both categories A and B utilized a specularly reflecting surface. This surface is typically achieved by deposition of a very thin layer of metal." Clearly, Haitz teaches that a reflective, metallic coating can be used on the sidewall since it is conventional in its prior art.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Butt et al. (US Patent 4,769,345), Han et al. (US 2006/0268579), Wang et al. (US 2003/0219919), Fujiwara et al. (US 2002/0153835), and Izuno et al. (JP 09/045965) all teach LED devices with one piece ceramic packages.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Makiya whose telephone number is (571) 272-2273. The examiner can normally be reached on Monday-Friday 7:30am - 4:00pm (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DJM/  
05/17/2008

/Y M. Lee/  
Primary Examiner, Art Unit 2885